CLAIMS

What is claimed is:

1. A sensing device for monitoring conditions at a remote location having an originating telephone number, the sensing device comprising:

(a) detecting means for detecting the conditions at the remote location;

(b) a transmitting module having a first power source, the transmitting module further comprising:

(1) reading means for reading the conditions at the remote location, and

(2) transmitting means for transmitting information regarding the conditions at the remote location;

(c) a base module having a list of pre-programmed telephone numbers that correspond to each of the conditions at the remote location, the base module further comprising:

(1) receiving means for receiving the transmitted information from the transmitting module,

(2) first processing means for selectively processing the transmitted information to determine which pre-programmed telephone number to call, and

(3) conveying means for conveying the transmitted information by using a telephone line to call the pre-programmed telephone number determined by the first processing means; and

(d) identifying means for identifying the remote location of the call to the pre-programmed telephone number,

whereby the conditions at the remote location are monitored by the identifying means.

2. The sensing device of claim 1 wherein the conditions at the remote location comprise conditions of a container at the remote location.

3. The sensing device of claim 2 wherein the container comprises a waste disposal container, the waste disposal container being filled with waste material therein.

4. The sensing device of claim 3 wherein the conditions of the waste disposal container comprise different levels of waste material in the waste disposal container.

5. The sensing device of claim 4 further comprising emptying means for emptying the waste disposal container, whereby the emptying means is activated by the identifying means to empty the waste disposal container.

6. The sensing device of claim 5 wherein the emptying means comprises at least one person physically emptying the waste disposal container.

7. The sensing device of claim 5 wherein the emptying means comprises routing at least one vehicle to the remote location to empty the waste disposal container.

8. The sensing device of claim 1 wherein the first power source comprises a battery supply.

9. The sensing device of claim 1 wherein the first power source comprises a first power source having a power level.

10. The sensing device of claim 9 further comprising conserving means for conserving the power level of the first power source.

11. The sensing device of claim 10 wherein the conserving means comprises activating

means for periodically activating the transmitting module, whereby the first power source is only utilized when the activating means activates the transmitting module.

12. The sensing device of claim 11 wherein the activating means comprises a slow timing circuit.

13. The sensing device of claim 12 wherein the slow timing circuit comprises:

(a) a counter having an oscillator therein, the counter further having a starting count and a pre-selected count; and

(b) a one-shot circuit,

whereby the counter triggers the one-shot circuit when the pre-selected count is reached, and the one-shot circuit thereby activates the transmitting module and resets the counter back to the starting count.

14. The sensing device of claim 13 wherein the oscillator comprises an oscillator having a frequency controlled by an RC time constant.

15. The sensing device of claim 13 wherein the oscillator comprises a slow oscillator.

16. The sensing device of claim 15 wherein the pre-selected count is set at five hours.

17. The sensing device of claim 9 further comprising measuring means for measuring the power level of the first power source, whereby the measuring means conveys information regarding the power level to the reading means.

18. The sensing device of claim 17 wherein:

(a) the reading means reads the conditions at the remote location and the power level of the first power source; and

(b) the transmitting means transmits information regarding the conditions at the remote location and the power level of the first power source.

19. The sensing device of claim 18 wherein the measuring means, the readings means and the transmitting means of the transmitting module, respectively, comprise:

(a) a measuring means having a first half of an OpAmp circuit;

(b) a reading means having at least one transistor, at least one resistor and an encoder, whereby the transistor and the resistor convey high and low switch information to the encoder, further whereby the first half of the OpAmp circuit conveys the power level information of the first power source to the encoder; and

(c) a transmitting means using the encoder to transmit information regarding the conditions at the remote location and the power level of the first power source to the base module.

20. The sensing device of claim 19 wherein the encoder comprises an encoding IC.

21. The sensing device of claim 19 further comprising delaying means for delaying the encoder from transmitting the information regarding the conditions at the remote location and the power level of the first power source until the circuitry is at full power and stable.

22. The sensing device of claim 21 wherein the delaying means comprises a second half of the OpAmp circuit.

23. The sensing device of claim 9 further comprising a second power source for providing power to the base module.

24. The sensing device of claim 23 wherein the second power source comprises a second power source having a power level.

25. The sensing device of claim 24 wherein the identifying means monitors the power levels of the first power source and the second power source.

26. The sensing device of claim 24 wherein the second power source comprises a transformer.

27. The sensing device of claim 26 wherein the transformer comprises a wall transformer.

28. The sensing device of claim 27 wherein the wall transformer comprises a wall transformer having a 12-volt DC output.

29. The sensing device of claim 24 further comprising:

(a) internal circuitry, the internal circuitry being located within the base module;

(b) a regulator, the regulator being connected to the internal circuitry;

(c) a full wave bridge circuit, the full wave bridge circuit being connected to the regulator, the full wave bridge circuit further allowing any polarity of DC input to power the base module; and

(d) a power input jack, the power input jack being connected to the full wave bridge circuit and to the second power source,

whereby the second power source provides power to the power input jack, the power inputs jack provides power to the full wave bridge circuit, the full wave bridge circuit feeds power to the

regulator, the regulator further provides power to the rest of the internal circuitry.

30. The sensing device of claim 29 wherein the regulator comprises a 5-volt regulator.

31. The sensing device of claim 24 further comprising recharging means for recharging the first power source and the second power source, whereby the recharging means is activated by the identifying means.

32. The sensing device of claim 24 wherein the list of pre-programmed telephone numbers further correspond to the power levels of the first power source and the second power source.

33. The sensing device of claim 24 wherein the base module comprises a base module having:

(a) at least one external first-indicator, the first-indicator allowing human operators to supervise the conditions processed by the first processing means at a distance from the base module; and

(b) at least one second-indicator, the second-indicator allowing human operators to supervise the conditions processed by the first processing means at a close proximity to the base module,

whereby the first processing means relays the conditions to both the first-indicator and the second-indicator, and the first-indicator and second-indicator indicates conditions by emitting a light.

34. The sensing device of claim 33 wherein the first-indicator comprises at least one lamp.

35. The sensing device of claim 33 wherein the second-indicator comprises at least one light emitting diode.

36. The sensing device of claim 1 wherein the transmitting means comprises an encoder

37. The sensing device of claim 36 wherein the encoder comprises an encoder that transmits data over an RF link.

38. The sensing device of claim 1 wherein the receiving means of the base module comprises a receiver and a decoder, whereby the receiver receives the transmitted information from the transmitting means and relays the information to the decoder, and the decoder conveys the transmitted information to the first processing means.

39. The sensing device of claim 38 wherein the receiver comprises an RF receiver.

40. The sensing device of claim 38 wherein the decoder comprises a decoding IC.

41. The sensing device of claim 1 wherein the first processing means of the base module comprises a first microprocessor.

42. The sensing device of claim 41 wherein the detecting means comprises at least one ultrasonic ranging unit, the ultrasonic ranging unit using the first microprocessor□s internal timing functions to detect the conditions at the remote location.

43. The sensing device of claim 41 wherein the detecting means comprises remote

sensors.

44. The sensing device of claim 41 wherein the detecting means comprises at least one switch input.

45. The sensing device of claim 44 wherein the detecting means comprises six switch inputs.

46. The sensing device of claim 45 further comprising transferring means, whereby the six switch inputs convey high and low switch information to the transferring means, and the transferring means convey the high and low switch information to the first microprocessor.

47. The sensing device of claim 46 wherein the transferring means comprises an inverter.

48. The sensing device of claim 47 wherein the inverter comprises a trigger inverter.

49. The sensing device of claim 48 wherein the trigger inverter comprises a Schmidt trigger inverter IC.

50. The sensing device of claim 41 further comprising:

(a) an operating program, the operating program being contained in the first microprocessor; and

(b) a watchdog IC having a strobe input, the watchdog IC generating a reset pulse to restart the first microprocessor in case the operating program is lost,

whereby the first microprocessor toggles the strobe input to prevent the watchdog IC from

generating a reset pulse.

51. The sensing device of claim 41 wherein the conveying means comprises a conveying microprocessor having a modem and an operating program.

52. The sensing device of claim 51 wherein the conveying microprocessor comprises the first microprocessor used for the first processing means.

53. The sensing device of claim 52 further comprising updating means for updating the list of pre-programmed telephone numbers stored in the base module.

54. The sensing device of claim 53 wherein the updating means comprises an updating means for updating the pre-programmed telephone numbers stored in non-volatile memory inside the first microprocessor.

55. The sensing device of claim 52 further comprising updating means for updating the operating program of the first microprocessor.

56. The sensing device of claim 53 or 55 wherein the updating means comprises a connector.

57. The sensing device of claim 1 further comprising a telephone jack, the telephone jack allowing direct connection to the telephone line of the base module.

58. The sensing device of claim 57 further comprising means for detecting when the telephone line is off-hook.

59. The sensing device of claim 58 wherein the off-hook detecting means comprises:

(a) a plurality of diodes, the diodes being connected to the telephone lines of the base module, the diodes generating positive and negative voltage changes;

(b) a plurality of discrete circuits, the discrete circuits detecting the positive and negative voltage changes generated by the diodes; and

(c) an opto-isolator IC, the opto-isolator IC receiving the voltage change information from the discrete circuits and relaying the voltage change information to the first processing means,

whereby the positive voltage change represents that the telephone line is on-hook, and the negative voltage change represents that the telephone line is off-hook.

60. The sensing device of claim 59 wherein the plurality of diodes comprise four diodes in a full wave bridge configuration.

61. The sensing device of claim 59 wherein the plurality of discrete circuits comprise:

(a) a first discrete circuit, the first discrete circuit detecting the voltage change information from the diodes; and

(b) a second discrete circuit, the second discrete circuit receiving the voltage change information from the first discrete circuit and becoming activated thereby,

whereby the activated second discrete circuit relays the voltage change information to the opto-isolator IC.

62. The sensing device of claim 59 wherein the opto-isolator IC comprises:

(a) a light emitting diode, the light emitting diode receiving the voltage change information from the discrete circuits, the light emitting diodes being lit if the telephone line is off-hook and staying dim if the telephone line is on-hook; and

(b) a phototransistor, the phototransistor receiving the voltage change information from the light emitting diode and relaying the voltage change information to the first processing means.

63. The sensing device of claim 1 further comprising disconnecting means for disconnecting the call to the pre-programmed telephone number after a predetermined number of rings, whereby the disconnecting means prevents the call from incurring a telephone toll charge.

64. The sensing device of claim 63 wherein the disconnecting means comprises a modem.

65. The sensing device of claim 63 wherein the predetermined number of rings comprises four rings.

66. The sensing device of claim 1 wherein the identifying means comprises a second processing means and a CALLER ID unit, the CALLER ID unit being connected to the second processing means.

67. The sensing device of claim 66 wherein the second processing means comprises a second microprocessor.

68. The sensing device of claim 1 wherein the identifying means comprises a CALLER ID unit.

69. The sensing device of claim 1 wherein the base module comprises a base module having reporting means for reporting conditions at a close proximity to the base module.

70. The sensing device of claim 69 wherein the reporting means comprises hard wire inputs in the base module.

71. The sensing device of claim 69 wherein the reporting means comprises an ultrasonic ranging unit.

72. A method of monitoring conditions at a remote location, comprising the steps of:

(a) detecting the conditions at the remote location;

(b) reading the conditions at the remote location;

(c) transmitting information regarding the conditions at the remote location;

(d) receiving the transmitted information;

(e) selectively processing the transmitted information to determine which of a list of pre-programmed telephone numbers to call;

(f) calling the pre-programmed telephone number;

(g) conveying the information; and

(g) identifying the remote location of the call.

73. The method of claim 72 wherein the conditions at the remote location comprise conditions of a container at the remote location.

74. The method of claim 73 wherein the container comprises a waste disposal container, the waste disposal container being filled with waste material therein.

75. The method of claim 74 further comprising the step of emptying the waste disposal container, the emptying step being activated by the identifying step.

76. The method of claim 75 wherein the emptying step is accomplished by at least one person emptying the waste disposal container.

77. The method of claim 75 wherein the emptying step is accomplished by routing at least one vehicle to the remote location to empty the waste disposal container.

78. The method of claim 72 wherein the detecting step comprises using remote sensors.

79. The method of claim 72 wherein the detecting step comprises using switch inputs.

80. The method of claim 72 wherein the detecting step comprises using an ultrasonic ranging unit.

81. The method of claim 72 wherein the reading step and the transmitting step occur in a transmitting module.

82. The method of claim 81 further comprising the step of providing a first power source to the transmitting module, the first power source having a power level.

83. The method of claim 82 further comprising the step of measuring the power level of the first power source.

84. The method of claim 83 further comprising the step of conserving the power level of the first power source.

85. The method of claim 83 wherein the reading step further comprises the step of

reading the power level of the first power source.

86. The method of claim 85 further comprising the step of encoding the information containing the conditions of the remote location and the power level of the first power source.

87. The method of claim 86 further comprising the step of delaying the transmitting step, the delaying step allowing all circuitry of the transmitting module to be powered up and stable.

88. The method of claim 87 wherein the transmitting step occurs over an RF link.

89. The method of claim 72 wherein the receiving step, the selectively processing step, the calling step and the conveying step all occur in a base module.

90. The method of claim 89 wherein the receiving step further comprises the step of decoding the information received from the transmitting step.

91. The method of claim 89 further comprising the step of providing a second power source to the base module, the second power source comprising a power level.

92. The method of claim 91 further comprising the step of reporting conditions at a close proximity to the base module.

93. The method of claim 91 wherein the conditions at the close proximity to the base module comprise conditions of a container at the close proximity to the base module.

94. The method of claim 91 wherein the conditions at the close proximity to the base module comprise the power level of the second power source.

95. The method of claim 92 wherein the selectively processing step comprises the steps of:

(a) firstly verifying the information received by the receiving step;

(b) secondly verifying the information received by the reporting step;

(c) matching a condition with a telephone number from the list of pre-programmed telephone numbers, the condition being verified by the firstly verifying step and the secondly verifying step; and

(d) sending the information regarding the condition to the calling step.

96. The method of claim 95 wherein the firstly verifying step comprises the step of waiting for two consecutive transmissions of the same information from the transmitting step, the waiting step ensuring that the transmissions comprise valid information.

97. The method of claim 95 wherein the secondly verifying step comprises the step of maintaining the reported information at high or low state for at least three seconds, the maintaining step ensuring that the information from the reporting step is valid.

98. The method of claim 95 wherein the matching step comprises the steps of:

(a) firstly matching the condition obtained from the receiving step and the reporting step with one of a plurality of switch inputs; and

(b) secondly matching the condition with the telephone number from the list of pre-programmed telephone numbers.

99. The method of claim 98 wherein the firstly matching step comprises the step of matching one of the switch inputs with the condition as follows:

(a) matching switch input 1 with the condition that the container is 1/4 full;

(b) matching switch input 2 with the condition that the container is 1/2 full; and

(c) matching switch input 3 with the condition that the container is 3/4 full.

100. The method of claim 98 further comprising the step of indicating each condition matched by the matching step, the indicating step allowing human operators to supervise the matched conditions.

101. The method of claim 100 wherein the indicating step comprises the steps of:

(a) firstly indicating at a distance from the base module each condition matched by the matching step, the firstly indicating step allowing human operators to supervise the matched conditions at a distance from the base module; and

(b) secondly indicating at a close proximity to the base module each condition matched by the matching step, the secondly indicating step allowing human operators to supervise the matched conditions at a close proximity to the base module.

102. The method of claim 101 wherein the firstly indicating step is accomplished with lamps.

103. The method of claim 101 wherein the secondly indicating step is accomplished with light emitting diodes.

104. The method of claim 72 further comprising the step of detecting whether a telephone line used by the calling step is off-hook.